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ABSTRACT

Healthy People 2010 is the initiative that defines the U.S. health agenda and guides policy. The initiative provides direction for individuals to change personal behaviors and for organizations and communities to support good health through health promotion policies. The objective of this research was to compare public and private schools on various health indicators collected from standardized assessment instruments. Data were available for 1,818 public school students and 1,862 private school students who completed the School Health Education Evaluation Instrument. Overall, public high school students reported higher percentages of behaviors that support food nutrition than private high school students. However, it is worth noting that number of responses scored as correct appears low for both groups of students and may warrant further attention. Educational policy makers need to address the problems associated with nutritional deficiencies and imbalances that could influence learning in schools. (Contains 5 tables and 10 references.) (SLD)

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Cross-Sector Research Associated with Nutrition: Comparison of Private and Public
Schools on Health Indicators

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Abstract

Healthy People 2010 is the initiative that defines the nation's health agenda and guides policy. The initiative provides direction for individuals to change personal behaviors and for organizations and communities to support good health through health promotion policies. The objective of this research was to compare public and private schools on various health indicators collected from standardized assessment instruments. Overall, public high school students reported higher percentages of behaviors that support good nutrition than private high school students. However, it is worth noting that number of responses scored as correct appears low for both groups of students and may warrant further attention. Educational policy makers need to address the problems associated with nutritional deficiencies and imbalances that could influence learning in schools.

DESCRIPTORS: Federal Legislation; Fund Raising; Nutrition; School Business Relationship; Vending Machines; Elementary Secondary Education; Food Service; Lunch Programs; Student Reaction; Eating Habits.

Cross-Sector Research Associated with Nutrition: Comparison of Private and Public Schools on Health Indicators

Healthy People 2010 is the initiative that defines the nation's health agenda and guides policy. Healthy Kentuckians 2010 is the state's commitment to the national prevention initiative Healthy People 2010 (Kentucky Department of Public Health, 2000). The two common overarching goals are (a) increase the quality and years of healthy life and (b) eliminate health disparities. The document provides direction for individuals to change personal behaviors and for organizations and communities to support good health through health promotion policies. In fact, health indicators are a key component of the initiative. The health indicators are intended to help everyone more easily understand the importance of health promotion and disease prevention and to encourage wide participation in improving health in the next decade.

Physical activity and nutrition are two essential areas. Physical activity throughout life is important for maintaining a healthy body, enhancing psychological well-being, and preventing premature death. Regular physical activity decreases the risk of death from heart disease, lowers the risk of developing diabetes, and is associated with a decreased risk of colon cancer. Regular physical activity helps prevent high blood pressure and helps reduce blood pressure in persons with elevated levels. Dietary practices are important as well as physical activity. Nutrition is essential for growth, development, and maintenance of every individual. Diet has been linked to preventable illness and premature death in the United States and to the nation's economic burden. In Kentucky, dietary factors are associated with four of the ten leading causes of death: (a)

coronary heart disease, (b) some types of cancer, (c) strokes, and (d) type 2 Diabetes Mellitus (Kentucky Department of Health, 2000).

School Nutrition and Learning

In the last two decades, researchers have studied the important topic of school nutrition, health, and learning. Goldsmith (1980) argued that nutritional deficiencies and imbalances could influence learning directly or indirectly. Fatigue, boredom and low motivation may be the result of poor nutrition. For example, some vision problems are associated to deficiencies in vitamin A. A number of studies indicate that protein-caloric malnutrition affects intellectual and psychomotor development.

According to Goldsmith, few educators may realize, though, that thiamine deficiency may decrease abilities involved in learning to read and write. The effects of some nutrient deficiencies, such as thiamine, iron, and minor vitamin A deficiencies, can be easily, rapidly and completely reversed. Unfortunately, the effects of protein-caloric malnutrition and major vitamin A deficiencies are not as easily changed. To some extent, however, they too can be reversed. A few studies suggest that improved environments, especially at the preschool level, can ameliorate severe effects of early malnutrition. Additional nutritional problems are associated with allergies, alcohol use, phenylketonuria (PKU), lactose intolerance, and minerals such as lead. The remarks above highlight only a few nutrition issues.

Since malnutrition is possible in affluent, developed countries, educators need to develop school-wide policy and practices that extend beyond school lunch, breakfast and nutrition education programs. Goldsmith argued that school policy makers should also

consider the effects of soft drink and candy vending machines as well as fund-raising candy sales.

Pertz and Putnam (1982) argued that while teachers are well aware of the effect of nutrition on children's health, they are less aware of the relationship of diet to the learning process. An indirect relationship between nutrition and learning exists because food is required to supply energy for learning. Research has shown that a highly nutritional breakfast results in improved student attention in late morning task performance. Poor nutrition reduces the body's capacity to resist disease and infection, and iron-deficient blood is inefficient in transporting oxygen to the cells of the body and brain. Researchers have shown a direct relationship between diet and learning indicating that protein-poor diets produce children who are less able to learn, have lower intelligence quotients, and poorer language development. The magnitude of the effects of nutritional deprivation appears to be positively correlated with its duration and severity and the developmental period during which it occurs.

Reading teachers should become activists in the field of nutrition education. According to Pertz and Putnam the points of a positive course of action for reading teachers are the following: (1) reading teachers and all educators should develop and enforce nutrition education programs; (2) teachers should stimulate children's awareness of and interest in good nutrition; (3) teachers should work with parents and school authorities to replace candy, sweets, and colas in vending machines with fruits, nuts, milk, and fruit juices; and (4) teachers should be alert to typical food allergy reactions, and bring them to parents' attention, encouraging consultation with their physicians.

Hinkel (1982) argues that dental disease, especially tooth decay, is reaching epidemic proportions among children of school age. Since sugar is a major cause of tooth decay and since many confections are sold in schools, it is recommended that schools remove confections and other nonnutritional food items from vending machines, fund-raising activities, and food services.

In terms of food items from vending machines, Hruban (1977) found that when students are provided a wide variety of snack foods of which a greater percentage are nutritious, they tend to select nutritious snacks. Hoerr and Loudon (1993) conducted another study associated with vending machines. The study was made of snack selections from non-refrigerated vending machines in relation to increased availability of nutrient-dense snack options and provision of nutrient information at four college sites. When snack options included more nutrient-dense choices, sales dropped. When nutrition information was posted on the machines, sales increased slightly.

Cline and Fitzgerald (1997) contend that due to shrinking financial resources accompanied by increased nutritional responsibilities, school food service professionals are employing economies of scale (central kitchens, cooperative purchasing, computerization, and high-tech food preparation equipment) and revenue-expansion opportunities (catering, vending machines, and "a la carte" menu choices). Creative marketing, innovative nutrition awareness programs, and qualified, well-trained staff enhance program cost-effectiveness.

In recent times, Vail (1999) argued that despite federal and state regulations prohibiting the sale of non-nutritious foods in competition with school lunch programs, powerful market forces are keeping vending machines in schools. In 1997, for example,

schools generated \$750 million for the vending machine market. Soft-drink companies are offering million-dollar contracts to some schools. The problem is that student nutrition suffers in the process.

More recently, French, Jeffery, Story, Breitlow, Baxter, Hannan, and Snyder (2001) examined the effects of pricing and promotion strategies on purchases of low-fat snacks from vending machines set up at secondary schools and worksites in Minnesota. Analysis of sales data indicated that reducing relative prices on low-fat snacks was very effective in promoting lower-fat snack purchases from vending machines in both settings.

Marlowe (2002) conducted another study associated with nutrition in schools. As of summer 2001, at least 12 states are deep-sixing junk foods in schools. Schools face an uphill battle on nutrition education. Commercials promoting junk food seem ubiquitous, and children are spending too many inactive hours watching television. Major challenges include the open-campus lunch period and cash-strapped schools using profits from school vending machines for programs and equipment.

In summary, among measures recommended are replacing junk foods in vending machines with more nutritious snacks, upgrading the quality of school food programs, teaching children to evaluate advertising, and becoming knowledgeable on nutrition and its effects on learning. The objective of this research was to compare public and private schools on various health indicators collected from standardized assessment instruments.

Evaluation Method

Participants

A large number of public and private students participated in this research. As it is the case in many educational settings across the nation, it was observed a higher percentage of non-minorities in the private schools. Table 1 displays the demographic information.

Table 1

Demographic Information of Public Schools Research Participants

<u>Variables</u>	<u>4-8 Grade</u>		<u>9-12 Grade</u>	
	<u>f</u>	<u>%</u>	<u>f</u>	<u>%</u>
Gender				
Males	925	50.9	2,132	49.4
Females	893	49.1	2,184	50.6
Race				
White	1,016	55.9	2,792	64.7
Minority	802	44.1	1,524	35.3

Demographic Information of Private Schools Research Participants

<u>Variables</u>	<u>4-8 Grade</u>		<u>9-12 Grade</u>	
	<u>f</u>	<u>%</u>	<u>f</u>	<u>%</u>
Gender				
Males	916	49.2	154	10.6
Females	946	50.8	1,293	89.4
Race				
White	1,786	95.9	1,370	94.7
Minority	76	4.1	77	5.3

Instruments

Data sources include (a) implementation checklist and (b) semi-structured interviews. The schools participating in the HPSE will complete a series of assessments appropriate to the age level, including the School Health Education Evaluation (SHEE) survey, Youth Risk Behavior Survey (YRBS), and the Physical Best. Evaluation of health instruction is a complex undertaking, made more so because of the need to assess change in attitudes and health behaviors as well as gains in knowledge.

The School Health Education Evaluation Instrument

The SHEE is a comprehensive instrument intended to assess the relative effectiveness of several school health instruction programs on students across grades 4 through 7. The SHEE includes multiple-grade and program-independent coverage of health practices, attitudes, and knowledge. The instrument is administered in an efficient and standardized manner in a large number of classrooms in widely dispersed locations. The total test administration time does not exceed one hour for the average classroom. Psychometric reliability and validity data have been extensively analyzed (Connell, Turner, & Mason, 1985).

The Center for Health Promotion at the Centers for Disease Control and the Office of Disease Prevention and Health Promotion directed Abt Associates to develop the SHEE (Connell, Turner, & Mason, 1985). The test was intended to address those learning objectives felt by experts in health instruction (i.e., professional health educators, teachers, parents) to be most important for children in grades 4-7. Using a Delphi methodology, instrument developers solicited input from over 100 knowledgeable individual to achieve consensus and to designate priorities for developing the

instrumentation. The framework that emerged included 10 content areas (mental health, personal health, growth and development, family life, nutrition, safety and first aid, disease prevention, drug abuse, consumer health, and community health), across the domains of knowledge, attitudes, and practices.

The Kentucky Youth Risk Behavior Survey Instrument

The Kentucky Youth Risk Behavior Survey (YRBS) measures the incidence and prevalence of behaviors that contribute to the leading causes of mortality and morbidity among youth in grades 9-12. By addressing and reducing these risk behaviors, schools and communities can promote the “resiliency” of young people and increase healthy behaviors. Measuring these risk behaviors will enable schools and communities to plan, evaluate, and improve school and community based programs which prevent health problems and promote healthy behaviors (Kentucky Department for Public Health, 2000).

Results

Table 2

Public School Health Education Evaluation Nutrition-Related Items (N = 12 Schools)

<u>Description of Item</u>	<u>Valid Response</u>	<u>Correct/Best Answer</u>
1. A good diet is important to me.	1,701	897 (52.7%)
2. It does not matter if people do not eat well, they can just take vitamin tablets.	1,685	829 (49.2%)
3. I play active games during recess at school.	1,716	984 (57.3%)
4. I drink several glasses of milk each day.	1,706	490 (28.7%)
5. I eat some candy every day.	1,711	146 (8.5%)

Table 3

Private School Health Education Evaluation Nutrition-Related Items (N = 13 Schools)

<u>Description of Item</u>	<u>Valid Response</u>	<u>Correct/Best Answer</u>
1. A good diet is important to me.	1,834	767 (41.8%)
2. It does not matter if people do not eat well, they can just take vitamin tablets.	1,838	352 (19.2%)
3. I play active games during recess at school.	1,838	1,010 (55.0%)
4. I drink several glasses of milk each day.	1,832	542 (29.6%)
5. I eat some candy every day.	1,837	278 (15.1%)

Table Public High School Student Survey

Table 4

Youth Risk Behavior Survey Nutrition-Related Items (N = 5 Schools)

<u>Description of Item</u>	<u>Valid Response</u>	<u>Correct/Best Answer</u>
<i>Food Choice and Habit Items</i>		
During the past 7 days,		
1. how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice?	4,154	276 (6.6%)
2. how many times did you eat fruit? (Do not count fruit juice.)	4,105	166 (4.0%)
3. how many times did you eat green salad?	4,152	62 (1.5%)
4. how many glasses of milk did you drink? (Include the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school.)	4,116	283 (6.9%)
<i>Sports and Exercise</i>		
On how many of the past 7 days,		
5. did you exercise/participate in physical activity for at least 20 minutes that made you sweat and breathe hard, such as basketball and soccer.	3,980	798 (20.1%)
6. did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	4,056	518 (12.8%)

Private High School Student Survey

Table 5

Youth Risk Behavior Survey Nutrition-Related Items (N = 3 Schools)

<u>Description of Item</u>	<u>Valid Response</u>	<u>Correct/Best Answer</u>
<i>Food Choice and Habit Items</i>		
During the past 7 days,		
1. how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice?	1,484	24 (1.6%)
2. how many times did you eat fruit? (Do not count fruit juice.)	1,478	24 (1.6%)
3. how many times did you eat green salad?	1,483	5 (0.3%)
4. how many glasses of milk did you drink? (Include the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school.)	1,478	54 (3.7%)
<i>Sports and Exercise</i>		
On how many of the past 7 days,		
5. did you exercise/participate in physical activity for at least 20 minutes that made you sweat and breathe hard, such as basketball and soccer.	1,440	260 (18.1%)
6. did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?	1,464	132 (9.0%)

Results

Nutrition Related Survey Items

A survey addressing youth risk behavior was administered to high school students attending both public and private schools in Kentucky. The following paragraphs describe results from the portion of the survey that concerned nutrition. This portion of the survey asked high school students to report behaviors concerning food choice (four questions) and level of activity (2 questions) for the 7 preceding days. One response for each survey item was scored as the correct or best answer, based on Kentucky's Healthy People 2010 nutrition guidelines.

When calculated as percent correct, public high school students scored higher than private high school students on every dimension. Specifically, public high school students reported drinking more 100% fruit juice (6.6% vs. 1.6%), eating more fruit (4% vs. 1.6%), eating more green salad (1.5% vs. .3%), and drinking more milk (12.8% vs. 9%). These trends continue when the data for sports and exercise items are examined. More public high school students (20.1%) reported exercising or participating in a physical activity such as soccer or basketball for 20 minutes than private high school students (18.1%). Public high school students also reported doing more exercises to strengthen or tone muscles than private high school students (12.8% vs. 9%).

Overall, public high school students reported higher percentages of behaviors that support good nutrition than private high school students. The differences between the two high school groups are particularly striking on the survey items concerning food

choice. However, it is worth noting that number of responses scored as correct appears low for both groups of students and may warrant further attention.

Health Education Survey Items

Another part of the survey addressed health education as it relates to nutrition. Results for to K – 12 students attending public and private schools in Kentucky are described below. One response for each survey item was scored as the correct or best answer, based on Kentucky's Healthy People 2010 nutrition guidelines.

Students were asked to respond to questions regarding the importance of a good diet, being active during recess, drinking milk every day, and eating candy. A large difference between public and private K-12 student responses indicates that public school students (45.6%) more clearly understand the limitations of vitamin supplements than private school students (19.2%). Conversely, private K-12 students were much more likely than public K-12 students to report being active during recess at school (55% vs. 33.7%). The largest difference between the two student populations occurred with the survey item concerning candy. Private school students (15.1%) reported eating candy on a daily basis compared to 5.6% of public school students. Public and private K-12 students did not seem to notably differ on their value of a good diet (44.4% vs. 41.8%, respectively) or whether they drink several glasses of milk each day (24.4% vs. 29.6 %, respectively).

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